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OUT OF THE BLUE AND INTO THE BLACK:

CREATION OF THE UNITED STATES SPACE FORCE

by

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The success of space assets in the Gulf War demonstrated the space capabilities of the United States to the world. Building on those successes of space from the war for the future of the nation. Unfortunately, the primary mission of the Air Force (airpower) has slowed the space power advancement. A solution to effectively apply space power for the United States lies in the creation of a separate service, or space force. Research was conducted using an organizational diagnosis as a theorem for strategic change. An autopsy of related research and literature was conducted in order to establish justification for a separate service to advance space power for the nation. The first dimension examined is the medium of space. Defining the medium, along with such areas as airpower and space power establishes a factual foundation from which to launch the idea of a separate service. Reasoning for and against a separate service is presented, including application of the Organizational Diagnosis to the Air Force. The model provides a skeleton to build the separate service, supporting the advancement of space power for the nation. The historical perspective of space and space assets in the Gulf War is reviewed, as well as a planned structure for the new service. The research concludes with the theory that a separate service is the optimal way to employ space power for the nation.

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Contents

Preface

"If you're not in space, you're not in the race." This quote, by General Lance Lord, Vice Commander, Air Force Space Command, charged me to examine the issue of a separate space force for the United States. Discovering the hardships General Billy Mitchell endured in his quest for a separate air service, I realized the time is right for the Air Force's space and missile assets to venture out beyond the constraints of our present atmospheric-bound Air Force. The value of this research is to encourage our leadership and our peers to think and act "outside the box." Realizing that original thought can sometimes be a dangerous thing, I felt that it is time we put our thoughts to proposed action and go for the brass ring of space: a separate service to advance the possibilities of space power for the nation. It is time to go out of the blue of the atmosphere and into the black of space. The advantages are infinite.

I would like to thank Lieutenant Colonel Theresa Clark, my faculty research advisor and fellow space warrior and General Lance Lord for his advice and guidance. I also must thank Colonel Pete Worden for his "outside the box" inspiration, General Charles Horner for adding credibility to the concept, and the maverick who inspired this idea: General Billy Mitchell. I also thank the USAF Institute for National Security Studies for their interest, sponsorship, and funding of this work.

Finally, I must thank my wife, Shawn, for enduring my enthusiasm about this project, and my son, Jack, who, I predict, can be a part of the United States Space Force.

Abstract

The success of space assets in the Gulf War demonstrated the space capabilities of the United States to the world. Building on those successes created an organizational challenge for the United States Air Force. This challenge was to advance the successes of space from the war for the future of the nation. Unfortunately, the primary mission of the Air Force (airpower) has slowed the space power advancement. A solution to effectively apply space power for the United States lies in the creation of a separate service, or space force.

Research was conducted using an organizational diagnosis as a theorem for strategic change. An autopsy of related research and literature was conducted in order to establish justification for a separate service to advance space power for the nation. The first dimension examined is the medium of space. Defining the medium, along with such areas as airpower and space power establishes a factual foundation from which to launch the idea of a separate service. Reasoning for and against a separate service is presented, including application of the Organizational Diagnosis to the Air Force. The model provides a skeleton to build the separate service, supporting the advancement of space power for the nation. The historical perspective of space and space assets in the Gulf War is reviewed, as well as a planned structure for the new service. The research concludes with the theory that a separate service is the optimal way to employ space power for the nation.

Chapter 1

Introduction

There are those who like to say that we have four Air Forces in America—they are absolutely wrong. This nation has one Air Force. There are other services with air arms, and they are magnificent air arms, who focus on certain things in support of our national capabilities...We are asked to provide for the nations air and space power, starting with science and technology; research and development; testing and evaluating; fielding, employing and sustaining air and space forces...That is our only job. It is not a diversion for us. We do it full time—all the time.

General Ronald L. Fogelman
As quoted in AFDD 2, Draft Version 7, 10 Oct 97

General Fogelman, in addressing the roles and functions issues of the Air Force, expressed his concern with the confusion created by the existence of an air arm in each of the four services. He implies that there should be no confusion—only the United States Air Force is in the business of providing air and space power for the nation. It is the Air Force's first and foremost job, and it performs it superbly. This paper examines the organizational challenge the Air Force encounters in providing air and space power for the nation.

The organizational structure of the Air Force is not designed to advance both airpower and space power for the nation. Dividing loyalties along two separate lines has caused confusion within the Air Force and between the services. The nation needs an institution devoted to the advancement of space power, and the present Air Force design

does not allow for optimal application of that end. The historical origin of the Air Force established a structure to advance airpower and airpower theory. While the organization did experience some structural changes since its establishment, the structure did not (and still has not) adapted effectively to promote space power and space power theory. Even in the Gulf War, space support to the warfighter was just that: support. Space was not allowed organizationally to come to the forefront—it was relegated to a support role.

Even in a support role, the Gulf War showed the nation that space power and space assets are decisive in war. The war displayed airpower application, air superiority, and space support to the warfighter. While much was made of the airpower successes in the war, the space successes were lauded very quietly. This is not unlike the early use of air assets in the Army.

The parallels that can be drawn comparing the Air Force today and the Army in the late 1920's are remarkable. The Army did not want a separate air arm. Professionals, like General Mitchell, felt that a separate air arm to promote airpower what was the nation needed to fight future conflicts. Today, the Air Force organization is designed to apply airpower for the nation. Space assets are used to support the airpower effort. Within the Air Force, loyalties are divided between the air arm and the space support assets. This division of duty is the driving force behind this research.

Research Question

Research was conducted using the following question: Why does the United States need a separate space force? The answers are presented in the following pages.

Thesis Statement

The United States needs a separate space force to advance space power for the nation. The organization will provide a medium to apply space power for the nation. This will allow the Air Force to dedicate itself to its original mission of airpower application without being burdened with space power related issues.

Background and Significance of the Problem

Examining the creation of a separate service to advance space power is a significant step in the future strategic planning of the armed services. This is not the first time the Air Force as an organization has been examined. Carl Builder, in his work, *The Icarus Syndrome*, examined the Air Force as an institution.[1] He concentrated on the role of airpower theory in the early development of the Air Force and the role it might still play in a host of problems that have come to plague the force as an institution.[2] His analysis stemmed from the creation of the Air Force to advance airpower for the nation. His goal was to recommend changes to improve the Air Force as a whole. This research paper also provides an organizational examination of the Air Force. The goal is the same: to recommend changes to the Air Force so it can perform its primary role: airpower application. At the same time, it suggests a solution for space power application, a separate space service.

Changing an organization to improve its function seems logical. Strategic planning, as defined by Manzini in *Organizational Diagnosis*, includes creating a blueprint for change, development, resource allocation, and implementation of strategic plans.[3] Diagnosing the Air Force and recommending changes to its structure assists in strategic

planning of the both the Air Force as it is structured today, as well as a separate space service.

Methodology

The methodology used to provide support for the idea of a separate space force consisted of independent research. This research included reviewing all printed matter pertaining to a separate space force. This included books, periodicals, other research projects, and Internet sources. The primary location of this research was the Air University Library at Maxwell Air Force Base in Alabama. Unfortunately, little has been written on the concept of a separate space service. Much opinion exists, but there is little fact to reinforce the opinion. Considering factual evidence as minimal, an established process or theory is necessary to provide credibility to the concept.

The methodology used to provide this credibility is the Organizational Diagnosis Model.[4] The organizational diagnosis process focuses on strengthening an organization to meet its future challenges. An organizational diagnosis is most useful when its aim is to help senior management assess what needs to be done to improve the organization so that it stands a better chance of achieving ambitious objectives. Creation of a separate space service is an ambitious objective. In this context, the focus of the diagnosis in this research is not so much on finding the cause of problems and solving them. Instead, it is based on assessing the organization in its present circumstances and on developing a forward-looking, proactive approach that changes what is no longer effective while preserving and enhancing the organizations unique assets and strengths. This enables the organization to examine relevant major issues as a means of preparing itself to deal effectively with the future.[5]

A properly designed organization reflects the classic theory of design, "form follows function." In this sense, the form of the organization (the Air Force) follows the official function, defined by the organization's mission, plans and goals (concisely, to apply airpower as an instrument of national power). The Air Force, in its present form, is not optimally organized to apply both airpower and space power without having one neglected. The diagnosis process directly supports the concept that the United States needs a separate service to apply space power for the nation.

Limitations of the Study

The establishment of a separate service is a monumental task. This paper concentrates on two salient points regarding a separate service. First, why establish the separate service for the advancement of space power? And, secondly, how will the structure of the separate service provide space power more effectively than the present day Air Force? Research uncovered many external factors relevant to the establishment of a separate service. Two areas, culture change and political impacts, have not been addressed at length in this study. These issues are important, but they are best examined in a different forum, using empirical evidence as factual support.

This study is also limited by the assignment parameters dictated by the Air Command and Staff College Research Project assignment, the Air University Style Guide and the Air University Research Template.

Preview of the Argument

The argument for this research paper is based on a historical perspective. From this historical perspective, application of both theory and doctrine lead to an employment of

strategy, and finally execution of an organization and application of force structure for a separate space service.[6] Space as an operating medium is defined, as is reasoning for a separate space service. A structure for the separate service is also examined. Facts related to the creation of the service, as well as differing views are presented. This research provides a solution to the confusion over the Air Force's mission.

General Fogelman expressed concern with the confusion created by the existence of air arms in each of the four services. Just as he exhibited frustration over the roles and missions of the Air Force in contrast with the other services, addressing space power organizational issues are just as frustrating. This frustration can be solved by education on the medium of space. The next chapter provides informational background on space, its characteristics, and the concepts of airpower and space power.

Notes

[1] Carl H. Builder, *The Icarus Syndrome* (New Brunswick, U.S.A.: Transaction Publishers, 1996), xiii-xix.

[2] Builder, 5-10.

[3] Andrew O. Manzini, *Organizational Diagnosis* (New York, N.Y.: AMACOM, 1988), 5-6.

[4] Manzini, 15.

[5] Manzini, 15.

[6] Dr. Matthew Caffrey, "Air and Space Operations Wargaming" Lecture (AO-510), Air Command and Staff College, Maxwell AFB, Alabama, 9 March 1998.

Chapter 2

The Medium of Space

Space is such a unique operating environment; it must not be compared or categorized as simply an extension of airpower. Space and air are two distinct mediums of operations. To operate in space requires a unique base of knowledge, one that is different than operating in the air. To relegate space assets to the collective term of "aerospace" power would do this nation a disservice. The term "aerospace" tends to merge both mediums into one entity. They are not one entity—they are distinct mediums that must be addressed on the tactical, operational and strategic levels of war.

Definition

There is no universally accepted definition of where space begins. The National Aeronautics and Space Administration defines space at an altitude of 50 miles (31.05 km) above the surface of the earth. To earn the right to wear astronaut wings, one must reach an altitude of more than 50 miles, but one does not actually have to go into orbit about the earth.[1]

The Air Force accepts the previous definition of space for award of astronaut wings, but subscribes to a different definition when dealing with space operations. Space begins at an altitude where an object in orbit about the earth will remain in orbit for a brief period before reentering the earth's atmosphere. This occurs at an altitude of about 80

miles (130 km) above the surface of the earth, and is considered a low-Earth orbit (LEO).[2]

Characteristics

The space-operating environment is different from that of terrestrial based forces. Space is the largest operating medium and surrounds all other operating media. Space offers the highest possible positioning above land, sea, air and special operations forces. This affords a commanding view of operations and provides an important military advantage.[3]

Space forces operate in accordance with the laws of astrodynamics. Air forces operate in accordance with the laws of aerodynamics. There is no general agreement on what defines the boundary between air and space; it is generally accepted that terrestrial based forces operate at an altitude of 100 km; space based forces operate above this altitude, where the effects of lift and drag are negligible. Space vehicles are designed for exactly that role: to operate effectively in the space environment.

Airpower and Space Power

Sir Winston Churchill stated that "airpower is the most difficult of all forms of military force to measure, or even express in precise terms."[4] Airpower and space power has been combined in many discussions of the role and function of the Air Force in its present structure. They are two different mediums, each with their own characteristics and definitions, and should be described individually.

Billy Mitchell described airpower as "the ability to do something in the air."[5] While this is a simple and basic definition, it applies to the role of today's Air Force. Operating

in the air, or atmosphere, of the earth is airpowers' medium. The Air Force is about airpower.

Space power, conversely, is the ability to do something in space. Air and space are two distinct mediums of operation. Herein lies the dilemma: the Air Force is based, doctrinally and strategically, on airpower theory. Its origins lie in a glorious history of airpower. Space, as the Air Force is presently organized, has become an extension of the airpower realm. Space power, as defined in AFDD 2-2, is the capability to exploit space forces to support national security strategy and achieve national security objectives.[6] While the Air Force provides for airpower very effectively, it does not promote space power as a primary function. Instead, it is relegated to a support role, causing neglect of the possibilities of space power. The argument lies in the organization's design to apply either air or space power. If form follows function, space power would be best provided for the nation by a separate service, or space force.

Notes

[1] Jerry Jon Sellers, *Understanding Space* (New York, N.Y.: McGraw-Hill, Inc.), 58.
[2] Sellers, 59.
[3] Air Force Doctrine Document 2-2, *Space Operations*, February, 1997, 1.
[4] Lt. Col Johnny R. Jones, *Air Chronicles*, n.p. On-line. Internet, 18 March 1998. Available from http://www.cdsar.af.mil/cc/jjones.html
[5] Jones, n.p.
[6] AFDD 2-2, 1.

Chapter 3

Why Establish a Separate Space Force?

We are evolving into more of an integrated Air and Space Force every day. But the true revolution to create a Space and Air Force is still some time away.

General Michael E. Ryan
US Air Force Chief of Staff
Speech to the Air Force Association National Symposium
Los Angeles, November 14, 1997

A basis of history for this study is relative to developing a separate service. The United States victory in the Gulf War demonstrated both airpower and space power capabilities to the world. Without a credible application of both air and space power in a major conflict like the Gulf War, this discourse might not have the same weight and factual evidence to support a separate space service. It is important to realize the weight of the contributions of space power to the Gulf War, use these contributions as a baseline, and consider a separate organizational structure to effectively apply space power for the nation.

The Gulf War: Demonstration of our Space Capabilities

The war in the Persian Gulf was a "coming out" party for the space assets of the United States Air Force. In fact, General Merrill McPeak called the Gulf War our "first space war" when he stated "Try to imagine the war without warning of scud launches, or

instant satellite communications, or weather coverage from space or other advantages the United States forces had because of our space capability. Space assets will play a central role in any future military action."[1]

The United States has maintained a presence in space for the last forty years. The establishment of the National Space Act of 1958 created the civilian agency, the National Aeronautics and Space Administration (NASA), to operate the civilian space effort, while the Air Force and other military services and agencies jockeyed for position within the Defense Department and the overall national space program. Although the Air Force won the contest for space "supremacy" among the services, it seemed to many Air Force leaders that the national policy of promoting the "peaceful uses of space" meant a diminished role for Air Force space interests and a threat to the nation's security. Nevertheless, by the end of the Eisenhower administration, the Air Force Space program revealed the basic defense support mission characteristics it would retain for the remainder of the century.[2] This support role has not changes measurably over the past forty years. The Air Force, as its history and doctrine dictated, had been dedicating itself to winning the Cold War and maintaining its "fly and fight" force.

The support role of space was brought to public attention during the Gulf War. When the United Nations ultimatum on Iraqi withdrawal from Kuwait expired on 15 January 1991, the Coalition decided on immediate military action. The Gulf War began on the night of 16-17 January with a massive air campaign led by F-117 Stealth fighters firing laser-guided weapons at targets in Baghdad. Following the radar-evading fighters came a series of coordinated air strikes in Iraq and Kuwait in conjunction with the launching of Navy Tomahawk cruise missiles. Coalition leaders thought the air assault

would last only a few days, but it continued for another six weeks. Because the combat phase of the Gulf War has been discussed in detail elsewhere, it is important to study the impact that space systems had on the outcome of Air Force operations in the Gulf War.[3]

Four space functional areas were used extensively in the Gulf War: communication, navigation, environmental monitoring and early warning. The first area, communications, affected operations the most. In fact, General Powell, Chairman of the Joint Chiefs of Staff, commented:

> When we started our deployment, we had only the most rudimentary communications infrastructure in Southwest Asia and the challenge of distance was daunting. Thanks to good planning and to our understanding of the importance of satellites, we quickly and smoothly transitioned to a mature tactical theater network.[4]

The military satellite communications network quickly proved its worth. When Coalition air forces began on 16-17 January what would become a 39-day air assault, they had the unprecedented advantage of access to a single database, or Air Tasking Order (ATO). Communications satellites also made possible immediate updates of target assignments and provided positive control of combat operations from pre-mission planning to post-mission aircrew debriefing. In short, the Defense Satellite Communications System (DSCS) provided guaranteed support to the command and control structure vital to the success of the war effort.[5]

Navigation satellites also played an important role in the Gulf War. In fact, United States Space Command's postwar evaluation would characterize GPS as "perhaps the most visible example of space systems support to United States troops in the Gulf War." [6] GPS supported every type of ground operation, from large-scale maneuvers to individual soldiers moving through the featureless desert. It allowed Special Forces units to operate effectively in enemy territory, artillery observers to target enemy positions and direct

friendly fire, and helped troops to clear land mines. In short, GPS supported the Army in desert operations and made possible the successful envelopment maneuver that brought the ground war to a rapid conclusion.[7]

A third aspect of satellite operations, environmental sensing, also supported the effort. When coalition forces launched the air war, they confronted the worst weather experienced in the Gulf in fourteen years. As Air Force Chief of Staff Merrill McPeak later commented, weather conditions were "at least twice as bad as the worst-case estimates."[8] Moreover, Coalition forces learned during the Gulf War that weather in the region proved notoriously susceptible to sudden changes. Heavy coastal fogs, blinding sandstorms and heavy rains could seriously hinder operations. Given these conditions, Defense Meteorological Satellite Program (DMSP) and civil satellites made possible the planning and execution of the most sophisticated air campaign in history.[9]

In addition to DMSP's support for tactical air operations, it aided in the movement of troops during the ground war. General Norman Schwarzkopf, commander-in chief of U.S. Central Command, thought so highly of DMSP that he always kept the most current DMSP data within arm's reach for quick reference. On balance, DMSP proved to be a crucial force multiplier during the conflict.[10]

Early warning satellites proved their worth in the Gulf War as well. Saddam Hussein saw in the surface-to-surface Scud missile, a terrorist weapon that could split the allied coalition and bring Israel into the war. The DSP satellite's role was to detect and provide sufficient warning support for strikes against the launchers and for the Army's Patriot batteries to intercept incoming missiles. Measures taken during the Gulf War to make the DSP system more tactically responsive proved successful. DSP satellites detected Scuds

in time to alert civilians and military defense personnel to don their chemical protection suits and take cover, and for Patriot batteries to engage the missile.[11] Granted, even though DSP was able to alert the population, casualties did occur from Scud missile impacts and interception destruction. Two such incidents occurred in February of 1991. The first incident occurred when a Scud missile hit the water 130 yards off the port side of the *USS Tarawa* as it docked in Al Jubail, Saudi Arabia, to offload Harrier aircraft. Luckily, the missile warhead did not detonate. The second incident occurred on 25 February, when a Patriot interceptor impacted a Scud missile. The remnants landed in Al Khobar, a suburb of Dhahran, Saudi Arabia, producing the largest single American casualty toll in the war. It killed twenty-eight troops and wounded ninety-eight others.[12] However, Scud missiles could have created greater casualty tolls if the coalition did not have DSP warning data. It provided the support necessary for the Patriots to do their job. Had DSP been developed and used in concert with a space power application role, it might have changed the impact of Scud use during the war.

Overall, military analysts concluded that, in the Gulf War, space systems supported a victory in the political battle, ensured effective command and control, and helped make the war a short conflict. These factors, in combination, saved many lives. Speaking after the conflict, General Moorman, commander of Air Force Space Command, observed:

> Desert Storm was a watershed event for space systems. Satellites, and the ground systems and people trained to control them played a crucial role in the outcome of the conflict. Space owned the battlefield. We had a robust on-orbit constellation and the inherent spacecraft flexibility to alter our operations to support specific needs of the terrestrial warfighter.[13]

In many ways the most impressive element of the Gulf War proved to be the ability of space personnel to adapt their systems to support the tactical warfighter. Fortunately, in Saddam Hussein, the coalition faced an enemy without significant space assets of his

own.[14] While the air planners dealt with their own buildup of forces, the space planners at both Air Force Space Command and United States Space Command already had sufficient assets in place, on-orbit, and were ready to respond to requests for assistance from the Joint Forces Air Component Commander, as well as the coalition forces.

While basking in the glow of a justly praised decisive victory, the United States military space community sought to learn and improve. One such late-blooming organizational improvement to the Air Force was the TENCAP program. The U.S. Congress mandated the TENCAP program (Air Force Tactical Exploitation of National Capabilities) in 1983. The program was implemented in 1993 by the Air Force at the Space Warfare Center at Falcon AFB, Colorado. It was aimed to improve command and control, mission planning and rehearsal, real-time information to and from the cockpit, air-defense integration, and space communications. In contrast to the Air Force's delayed start, the Army and the Navy to spent and established strong TENCAP-type programs in the mid-1980's.[15] This procrastination on application and integration of space power into the Air Force caused a gap in Air Force space application, support to the warfighter, and use of space on the battlefield. Overall, Air Force commitment to the TENCAP program barely existed. This institutional neglect is a contributing factor to the need for a separate space service.[16]

Even systems traditionally more oriented toward tactical operations encountered problems. In order to meet the challenge of supporting the warfighter, Air Force Space Command leaders realized they must lead the effort to modernize space infrastructure, continue technical improvements to space systems, extend space awareness, and apply space power throughout the Air Force and the armed forces as a whole. They expected

the Gulf War to provide momentum in the early 1990s for improvement in every area of space operations. It did not. Instead, the Air Force pressed ahead with high priced items like the B-2 Stealth bomber, the F-22 Raptor, and the C-17 Globemaster. Little attention was given to space integration or space power application. In fact, space systems, like GPS, were not even included in the initial version of the new F-22. Oversights like this helped to focus the attention of the military space community on systems and capabilities for the Air Force—again, in a support role.

In the aftermath of the Gulf War, Air Force Space Command (AFSPC) pushed for the "normalization" of space within the Air Force and throughout the military community.[17] Its focus was on the four mission areas first established in the mid-1980s: space control, force application, force enhancement, and space support.[18] The major problem with this focus was the lack of Air Force enthusiasm, along with a commensurate lack of funding, to go along with the effort. AFSPC had the right intent, but the host structure of the Air Force was concentrating on its primary mission—airpower. The Organizational Diagnosis model helps illustrate why the Air Force focuses on its primary mission, to the detriment of the space power mission.

Organizational Diagnosis

Levinson, in his work, *Organizational Diagnosis*, relies on three areas to analyze an organization for improvement. These include baselining the organization through its historical context, analyzing which historical forces continue to influence its activity, and applying this analysis to the current organization. These categories equate to the Air Force and its Army origins, airpower as a driving force in the Gulf War, relegating space

to a support role, and application of space within the Air Force, but still in a support role to airpower, not as an active space power.[19]

Despite the space support success in the Gulf War, a dilemma was created as to how space assets should be controlled and organized by the Air Force. The Air Force Space Command and United States Space Command provide a supporting role to the larger roles and functions of the Air Force. Application of space power is not included in the vision statement of the Air Force, "*Global Engagement: A Vision for the 21st Century Air Force.*"[20] While the document itself does address space support issues, it does not predict a transition to a Space and Air Force until after the twenty-first century. This is a significant departure from earlier policy stating that the Air Force would transition to a Space and Air Force. It is a combination of institutional neglect as well as a lack of a promised reality of a Space and Air Force. It magnifies the concept of inertia within the organization.

Inertia

The term inertia, as defined by Webster, states "a property of matter by which it remains at rest or in uniform motion in the same straight line unless acted upon by some external force." The present environment in today's Air Force is one of inertia when it comes to implementing a structure to advance space power for our nation. While space has been written into some of the Air Force documentation, the evolution to an Air and Space Force or a Space and Air Force has stalled. The Air Force is concentrating on airpower to achieve its core competencies. These competencies, air and space superiority, global attack, rapid global mobility, precision engagement, information superiority, and agile combat support effectively apply airpower. The Air Force relies on airpower to get

the mission done, using space as a support function. The organization itself is designed to accomplish its airpower mission very effectively. It is not efficiently organized to accomplish its space power mission. Noted authorities on space and airpower have views on this issue as well.

General Charles Horner, in speaking to the Air War College, stated that many of today's Air Force leaders consider operations in space "simply a higher altitude; it is a matter of turf and the battles of turf."[21] He also stated that this turf battle is affecting the combat capability of our nation and it's ability to fight wars. His assessment, after using space assets in the Gulf War, was right on target; after all, he commanded both air and space assets during the war—he was aware of the importance of space power to the warfighter and to the coalition forces. He agrees with the concept of a separate space service, and is vocally supporting it in public forums.

The Separate Service

Professor I.B. Holley of Duke University examined the idea of a separate space service in May of 1989. In his proposal, he stated that a separate space service would be best served in order to maximize our effectiveness in space. Both history and philosophy would suggest that this thinking is sound: Historically, early rocket forces in the United States were relegated to the rear echelon, as muskets were the preferred weapons of the day.[22] This is not unlike to present tempo in today's Air Force: if you operate an aircraft, you are the front line troops; if you deal with space, you are relegated to the rear echelon to support those who operate aircraft. The organizational diagnosis model states that form follows function: the form of the Air Force follows its function—the priority to apply airpower.

Space Doctrine, as stated in AFDD 2-2, expands upon the basic Air Force beliefs outlined in AFDD-1, Air Force Basic Doctrine, as they pertain to Space and Air Force responsibilities and missions. In fact, AFDD 2-2 provides fundamental principles that apply to today's space operations, in order to organize, train, equip and operate our space forces. Unfortunately, this approach to space doctrine appears dogmatic; that is, it bases our space operations by building on air operations. Getting this process right is paramount to a well-established space force. General Ronald Fogelman, USAF, has a strong view that aerospace doctrine is more than just a theory:

> The ultimate goal of our doctrine should be the development of an airman's perspective on joint warfare and national security issues—not just among our generals, but among all airmen in all specialties...Despite this challenge, the payoff of getting it right is tremendous. The ultimate promise of our doctrine is its potential to accomplish the mission, achieve the warfighters objectives, and—not insignificantly—to save lives on the battlefield.[23]

General Fogelman specifically addresses joint operations in aerospace doctrine. The ideas he presents can be applied to the joint arena, as well as space operations.

A separate space service would pursue its own unique doctrine, and strategy, missions and functions. These functions, operating independent of an Air Force, pursue concepts that are not restricted by atmospheric paradigms. General Horner has also stated that a separate space service is needed. He suggests transferring all space acquisition from the Air Force budget into a budget of its own while keeping space operations within the service. He also proposes a joint space service, to be established by a certain deadline, and work toward that deadline by identifying all space assets of the present services; then transfer them to a separate space service. "This delineation of air and space to space seems to be a roles and missions grab on the part of the Air Force. Space and Air are far too important to trade off against each other, and that is just what

we are doing."[24] This trade off has caused the role of space power to suffer and will eventually impact the effectiveness of airpower for the Air Force.

"Airmanship versus Spacemanship"

General Billy Mitchell was well aware of the differences in those who flew in the air versus those who walked on the ground very early in his career. In, fact, in his book, *Winged Defense*, he discussed the issues of operating on the sea versus operating in the air. Simply stated, he delineated the differences in the operating mediums. These differences demonstrate an evolution in the application of power from the medium of the sea to the medium of the air. Understanding space as the fourth medium of operations is essential to the discussion of space as a separate service.

General Howell Estes, CINCUSSPACECOM, provides an explanation of this medium. The first medium of military operations began with land forces, fighting each other for limited resources. Warfare then transitioned to the second medium, the waterways and seas, with the advent of commerce and naval fleets. As technology progressed, the use of the airspace, the third medium, above the air and water became an area of operations. As this medium grew, it became apparent that air operations were indispensable to protecting our nation's vital interests. While land, sea and air operations are the first three mediums of military operations, we have made a giant leap forward in to the next, or fourth medium, space. Space systems are indispensable to our warfighters today in providing space power to the nation. The civil, commercial, scientific, and military benefits derived from space are growing in importance and influence as key contributors to the instruments of America's national power.[25] Space is the fourth

medium of military operations. General Mitchell understood the differences of operating mediums very well—well enough to propose a service to support the medium of air.

The differences Mitchell saw in his early career created the aura of "airmanship." Those who were daring enough to go up in their flying machines were to be an elite group, somewhat misunderstood by those who chose to remain on the ground. The ground-walkers, commonly referred to at the time as the Army, did not take kindly to Billy Mitchell and his ideas on "airmanship." They found his ideas downright treasonous! This distinction that was created ultimately cost Billy Mitchell his career, and he was court-martialed for being a vocal proponent of the air service.

There are numerous similarities between Billy Mitchell's ideas on airmanship and space warriors ideas on spacemanship and space power. Much like the air operator, the space operator has a spirit, language and customs of his or her own. Instead of using space as a force multiplier, it has become a dilemma of airpower versus space power.

Theory and Doctrine

Theory and doctrine are boundless for space operations and a separate space service. Carl Builder, in his book, *The Icarus Syndrome,* examined the ideas of airpower theory at length. In fact his two theses directly affect the concept of a separate space force presented in this paper:

> - Airpower theory was a crucial element in the evolution and success of the Air Force as an independent military institution, but
>
> - The subsequent abandonment of airpower theory in the face of competitive means (missiles and space) and ends (deterrence theory) cast the Air Force adrift from precisely those commitments that had propelled it to its institutional apogee in the 1950's.[26]

These concepts explained in the new Air Force Doctrine Document 2-2, shed new light on the realm of space operations. An excerpt from the foreword of the document explains space power's place in today's military environment:

> Early use of airpower focused on reconnaissance and the planes ability to provide a broader perspective of the battle area to commanders, but later evolved into the preeminent operations arena...Space, like early airpower, provides a better perspective of a theater and the world for today's leaders. It provides a virtual presence not previously possible. Also, like early airpower, space development was focused on reconnaissance and intelligence. Space systems are maturing, from the equivalent of the biplane in World War I simply performing reconnaissance, to become the ultimate high ground of today's military.[27]

The concepts, theory and doctrinal basis of the present day Air Force are well defined. They have been used effectively in the Gulf War, as well as other operations. Creating another doctrine document, specifically AFDD 2-2 can assist in a transition to a space and air force, but a better solution would be to organize for space in a separate service.

The delineation of how space doctrine and theory should be applied is based on the concept of space power. Space power is the capability to exploit space forces to support national strategy and achieve national security objectives.[28] In addition to space power, the characteristics and space systems contribute to the ability to apply theory and doctrine.

Embedded in the original airpower theory were vivid images of a war just past, the prospects for another in the future, and of the rapidly developing transportation technologies. The theory explained how the aviation technologies might be exploited to avoid replaying the past war in the future. The theory was motivated and rationalized on a perspective of the future. Space theory and doctrine is based on the ideas that the early

leaders in airpower founded what we know as our present day Air Force. The future of space is dependent on how we see the world situation and the future nature of conflicts.

Positive and negative reasoning

Many of the positive aspects for the creation of the United States Space Force have been covered in previous sections of this paper. The end-state for this study is the creation of a separate service. But, like any fact-based decision-maker, one must weigh both the positive and negative issues before committing to a decision.

The negative aspects of creating a separate service are varied. Many opinions exist in the related literature, but few are based on empirical evidence. Carl Builder, in his work, *The Icarus Syndrome*, addresses two areas of the Air Force that might be divested for the good of the whole force:

Space Systems: These have become national assets used to support all of the services. Surveillance, communications, and navigation support from space are essential now for all military operations. Although each of the services has special needs or priorities, these are converging rather than diverging over time. The increasing emphasis on joint service operations demands common frameworks and formats for communication, navigation and surveillance information. Unless or until military forces are deployed into space—which seems unlikely in the near future—space systems should be treated as shared infrastructure for all of the military services.[29]

Ground launched missiles, both ballistic and cruise: These Air Force weapons were all designed and deployed as alternative means for the delivery of nuclear weapons. With the virtual evaporation of the nuclear threat so long posed by the Soviet Union, these missiles now face declining prospects. Their original development was predicated upon a

major nuclear war; and not only is the prospect for that type of war declining, so is their prelaunch survivability in such a war. While these weapons have provided an important diversity in America's nuclear arsenal, that diversity was prized as a deterrent against a massive nuclear surprise attack, which is no longer an overriding national concern.[30]

It could be argued that sacrificing one or all of the above two ends and two means would not take the heart out of the Air Force. These battles of the services are reminiscent of the early days of airpower and divestiture of the air arm of the Army to a separate Air Force. Some of the interservice and intraservice battles in our history have shown how difficult service roles and mission definitions and control actually are. A few examples follow:

-The Army and the Air Force over the close air support mission,
-The Air Force and both the Army and the Navy over ballistic missile developments,
-Transport and combat aviation communities over their relative status within the Air Force,
-The Air Force and the Navy over the targeting and control of strategic nuclear forces,
-Bomber and fighter aviation communities over leadership of the Air Force, and
-Pilots and everyone else in the Air Force over their relative status.

Thus, historical battles of divestiture choices—choices that are admittedly too hard for the Air Force to make for itself, but which do not go to the heart of the institution—are beguiling to those who see the current contradictions in the Air Force. Sharing two missions with the Army and cutting the unmanned missile and space systems free could make for an entirely new landscape for the Air Force to consider what it means by airpower.

However, participating in—let alone initiating—any part of this kind of radical surgery for the sake of coherence in the theory or vision of airpower is simply unrealistic.

Such amputations would ignore the circumstances of history and bureaucracy, which have brought about the present predicament. The solution to this dilemma must not only make logical sense but must also be practically feasible. If a redefinition of airpower as a theory, mission, vision or strategy can only be found in divestiture of current Air Force missions and systems, the odds against its being accepted, no matter how easily it might be found or argued, are minimal.[31] Considering these historical issues leads to a conclusion of animosity and unwillingness to work together amongst the services. The concept of unity of effort is paramount especially when it comes to space power. All the services must be in agreement when it comes to space issues—a divided space house will not be able to accomplish advancement of space power for the nation, and will only contribute to inertia.

The opening epigraph in this chapter described inertia and its relationship with inaction towards a Space and Air Force in today's Air Force environment. Reluctance to advance space power while concentrating on airpower will prove to be detrimental to our future as both an air and space nation. General Ryan believes that the Space and Air Force is still some time away. This reluctance to change is considered in the Organizational Diagnosis process.

Reluctance to Change

The Organizational Diagnosis Model defines this reluctance to change and inertia in three areas: first, the organization may have insufficient preparation to understand and accept the system. The Air Force may be reluctant to address the issue of space power as it may detract from the primary mission of airpower. Second, there may be an insufficient quantity of individuals qualified to manage it. As space is a relatively new

medium of operations, there are not many senior leaders who "grew up" in space. Many of them started in an airpower role and have been placed in charge of space assets without much experience. Finally, the conflict and ambiguity of a new structure makes leadership reluctant to change. This point is true for any uncertainty. Conflict in establishing a structure to advance space power could concern even the most stoic leader. Avoiding the sin of inertia is key to building a space force for the future. The next chapter concentrates on action planning and structuring the new service in order to advance space power.[32]

Notes

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[23] *Aerospace Doctrine: More than just a theory*, AF Air and Space Doctrine Symposium, Maxwell AFB, Alabama, 30 April 1996, Page 7.

[24] Horner, 3.

[25] General Howell M. Estes III, "Space: Fourth Medium of Military Operations" *Defense Issues* 11, no. 98 (October 1996): 3.

[26] Carl H. Builder, *The Icarus Syndrome* (New Brunswick, U.S.A.: Transaction Publishers, 1996), xiii.

[27] Air Force Doctrine Document 2-2, *Space Operations*, February, 1997, Foreword.

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[29] Builder, 224.

[30] Builder, 224.

[31] Builder, 225-226.

[32] Builder, 229-230.

Chapter 4

How will this separate force be structured?

General Smith to testify today: Washington, April 1, 2012: General William Smith, Chairman of the Joint Chiefs of Staff, will testify on Capitol Hill today in front of the Senate Armed Services Committee and the Senate Select Committee on Intelligence. The general's testimony will concern the surprise attack on U.S. forces by the Chinese last December...

—Lt Col Michael E. Baum, USAF
Defiling the Altar: The Weaponization of Space
Airpower Journal, Spring 1994

Congressional Scenario

Lt. Col. Michael E. Baum, USAF, looking to the future of the United States in a technologically saturated world, presents a chilling scenario of our inability to operate as a military force in the space environment. Fictional in nature, it shows the United States Air Force as ill-prepared to defend space systems and use them to their maximum effect during a military crisis. It specifically addresses weapons in space, but it presents a larger, more pressing issue: the reluctance of the United States as a military power to exploit the capabilities of space power for the benefit of protecting the continental United States.

While a space war may seem far in the future, it causes one to think about the possibility of space assets in a space power role. Creating a structure to apply space

power for the nation is critical. Three issues that must be considered when creating a separate space force are finance, personnel, and the organization's structure.

Financial Realities of a Separate Service

Impacts to the Planning, Programming and Budgeting System (PPBS) of the United States will occur with the establishment of a separate service. Achieving the goal of a federal balanced budget will place strains on an already limited military budget. Increases to the military budget will be necessary to support the five services. The military services are in competition for this shrinking resource. In fact the military budget allocation process has seen a decline of 45% since the end of the Cold War.[1] With this in mind, it will be important to achieve the goals of improved quality and productivity, decreased costs, enhanced military effectiveness, and unity of effort.

Presently, four services compete for limited budget dollars. With the addition of the Space Force, a fifth element would be a player for the limited cash flow. Instead of space assets "stove piping" themselves within the services, the Army Space Command, Naval Space Command, Air Force Space Command, and other space elements of the Defense Department will be aligned and streamlined under the United States Space Force.

The present PPBS system used by the United States is an effective framework for the allocation of resources for all the armed services. The competition between the services can be alleviated, or even eliminated, if a new service was formed to control space and missile assets. Of course, the opposite could also happen—competition could get even worse. This is where unity of effort is important. Instead of the services jockeying for position as the steward of space, the new force would have the lead on all space and space power issues, allowing the other services to operate in their respective mediums.

A separate space service will allow for increased economies of scale and asset sharing by all the services. Overall, it should show an actual reduction in the amount of money necessary to operate and maintain a space presence in the United States. Since the Air Force will not have to compete for funding for both air and space assets, it should make the allocation of resources much simpler. At the present time, the Air Force is constantly competing with itself for funds for both air and space operations. This competition has proven costly for many systems and programs. In fact, the Air Force has provided over 90 percent of the military's space budget and 93 percent of its space personnel. The United States alone has over 220 active commercial, civil, and military satellites in orbit, with a combined value of $100 billion.[2] This will also affect the other services. Their infrastructures will no longer have to support their individual space missions—the Space Force will handle those issues.

Funding issues for a separate service are vast. Space systems are weighed against airpower systems like the F-22, B-2 and other aircraft. Land systems are weighed against space research and development. Shipbuilding is weighed against submarine satellite communications systems. To what end do the services fund? To support the primary mission (i.e. the Air Force airpower mission), or to support the mission of space power? This is the dilemma of financing our Air Force, and other services, today.

While funding is an issue, operating the complex systems of a space force will still require competent, motivated personnel. Personnel will be a key component in advancing space power for the nation.

Personnel and the Separate Service

The benefits of space assets have only recently begun to emerge as we find the need to deploy less personnel in-theater to provide weather, communications, navigation, and missile warning support. Space assets have made the load lighter for the warfighter. Planning for deployments is made easier by the effective use of space technology, instead of the use of masses of troops. This is the best support we can give to our warfighters: reduction of risk from enemy engagement by effectively using space assets.

The United States is at the leading edge of what we can do to support the warfighter, but the possibilities are seemingly endless when dealing with the medium of space. The generation of warfighters that is present in our military is one that has been raised on technology. Videotapes, video games, compact discs, digital technology, cellular phones, instant media coverage, internet access and computer proliferation have conditioned the nation's warfighters to operate in the technologically-saturated medium of space.

Technical Expertise and Leadership

The new space force will have to be a lighter, leaner, and more lethal service. At present, space and missile operations forces are recruited from all walks of life: economics, mathematics, liberal arts, physics, history, political science, etc. The future of a strong space force demands two criteria for "admission:" leadership and technological orientation. This is not to say the other concentrations should be discounted; it does say that for a successful force to remain small and lethal, its personnel must be aware of all aspects of space and missile operations.

To produce a force that is technically suited to the rigors of space operations, a recruitment campaign must be established that rivals the campaign used after World War

II to recruit Germany's best and brightest scientists and technicians to the United States to work on missile programs. A three-pronged recruiting campaign is necessary to staff the new service:

1. Recruit from the technical universities and schools, including establishment of a training program sponsored by the Space Force
2. Recruit from existing technical and technology-based corporations
3. Recruit from all existing services for technically oriented leadership.

This pool of knowledge will allow the Space Force to emerge with a level of technical talent that is current and ready to meet the challenges of the future of space technology. This talent will lead the separate force and will have the voice necessary to advance space power for the nation. How these leaders will be organized is the final consideration for the separate space service.

Structure of the Separate Service

National and international military headquarters invariably contain a command section and a staff similar to that used by Air Force Space Command today. The size and configuration of each staff reflects tasks any given organization must perform. Major military space headquarters will need special staff sections that focus specifically on space. Functions such as space law, space medicine, space engineering, space ordnance, and space civil and military affairs must be considered in the new staff. Other areas, such as intelligence, logistics, policies and plans, operations, logistics, personnel, and command, control, communications and computers will also be necessary for an effective structure.

Centralization of the staff structure (centralized control, decentralized execution) will be the norm for the new staff. The military space force will rely on supercomputing power as well as neural networks and artificial intelligence. Maintaining and repairing such systems will also be a force structure issue. The separate space service will assimilate the present-day missile operations forces into the new service. These forces and assets come to the table with a wealth of space launch and space control knowledge, as well as force application and space power expertise.

Space and Missile Operations assimilation

The concept of both missile operations and space operations as one cohesive organization is not necessarily new. Air Force Space Command and United States Strategic Command was directed in the early nineties to move towards a Space and Air Force by combining the space and missile operations career fields, as well as changing the name of missile wings to space wings. This push towards unification of both areas is a healthy realization of where space is headed. Missile operations brings with it a heritage of research, development and exploration that will help form the culture of the new service. A founding father of the missile operations establishment, General Bernard Schriever was at the forefront creating this heritage.

General Bernard Schriever was instrumental in the creation of the United States Ballistic Missile program, as we know it today. After the Soviet Test of a hydrogen bomb in 1953, ballistic missile development became a national priority on the scale of the Manhattan Project of World War II. The Air Force ICBM program, implemented in 1954, cut across the jurisdictional lines separating the then-named Air Research and Development Command and Air Materiel Command. Authority flowed from the

Secretaries of Defense and Air Force (both of whom were advised by a special scientific committee) through the Chief of Staff of the Air Force, and the ARDC Commander to Brigadier General Bernard A. Schriever—who had been appointed to manage the fledgling Atlas missile program on 5 May 1954. General Schriever pioneered both the ultimate realization of the Weapon System Project Office and the strategy of concurrency. His management of the program and later missile programs served as a template for future leaders to follow. Without his guidance, drive and "infinity thinking," the United States might have never closed the missile gap of the Cold War.[3]

For the past eight decades, the Air Force and its predecessors have striven to organize and manage the acquisition of weapon systems as effectively as possible. The chosen structures and processes reflected the technologies, politics, economics, world events, and prevailing corporate culture of the times. The next logical step will be to align space force acquisition under a separate service to more effectively build the light, lean and lethal space force; a force that is built faster, better and cheaper, and relies on space power for its theory and doctrine.[4]

Organizational Diagnosis

The structure of the organization presented follows the concept introduced in Chapter One: form following function. The Space Force is designed to advance space power for the nation. While organizational changes in the Air Force in the early 80's did create some streamlining, it stopped short of creating an organization to advance space power for the nation. The blame for this reluctance and inertia can be fixed on the airpower leaders of the time. They were more concerned with the performance of

airpower than advocating a space power role for the Air Force. The change was not complete enough.

Creating the structure of the new space force will go one step further. The new space service will be optimally designed to advance space power for the nation. The next chapter will review the prescription for this research and reaffirm the conclusion that the United States needs a separate space force to advance space power for the nation.

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[4] Benson, 50.

Chapter 5

Summary and Conclusions

If everyone is thinking alike then someone isn't thinking.

—General George S. Patton, Jr.
War as I Knew It, Autobiography

A Prescription for the Organizational Diagnosis

The purpose of this paper was to justify the need for a separate space force to advance space power for the nation. The Organizational Diagnosis model analyzed the ability of the Air Force to achieve ambitious objectives. The concept of "form following function" was explored for the Air Force, establishing the Air Force as the primary provider of airpower application for the nation. Overall diagnosis of the Air Force and recommending changes to its structure in order to advance space power is useful for strategic planning of the armed services.

Clearly, in order to advance space power, a separate service structure will have to be established, unhindered by the doctrine of airpower. The form of a separate service will advance a space power function for the nation. Establishment of this service will bring the United States into the next millenium as a world space power.

Implications

Air Force and aerospace industry leaders have looked into the boundless expanse of space, recognizing the next frontier in military operations, and they describe the view as humbling. Few should doubt, however, that tapping the vast potential of space would require bold leadership and profound changes in the nature and culture of the Air Force.[1]

Carl Builder, in *the Icarus Syndrome*, identified the new Air Force as one built upon the identity of the Army. In fact he stated:

> Air forces are more difficult to organize and put on a sound footing than either an army or a navy, because, in this newest arm we have no traditions upon which to build except those developed during the war.[2]

The separate space service is the best means for the United States to advance space power for the nation. Its mission will not be clouded with conflicting doctrine or theory. In fact, General Mitchell said it best:

> The mission of each branch of the national defense must be clearly stated and its powers and limitations thoroughly understood in order to combine its action with the other branches to insure the maximum effect.[3]

This unity of effort is a key constraint on all the services. Without unity of effort, it will be impossible to act as a unified force to protect the vital interests of the United States. A separate space service will contribute to this unity of effort, at the same time providing the necessary space power for the nation.

Conclusion

Realizing the importance of airpower and space power for the nation was the key to the research presented in this paper. Once the definition was established, reviewing the successes of space application in the Gulf War demonstrated the importance of space power in achieving the nation's objectives. Refining the reasoning of a separate service

for space was examined, including the clarification of airmanship and spacemanship, as well as the issues of theory and doctrine. The positive and negative aspects of the separate service were exposed, revealing salient reasons for a separate service. Finally, the structure of the new service was presented, including finance, personnel and organizational issues.

Throughout the document, the Organizational Diagnosis model acted as a skeleton to support the formation of a separate service to apply space power for the nation. The argument for or against a separate service is controversial. Based on the historical perspective presented, facts of airpower and space power were uncovered. Considering space as a unique operating medium does not allow for categorization of space as an extension of airpower. It is a separate and distinct entity, and, as such, should be addressed as one. The conclusion that a separate service is necessary to advance space power for the nation is a result of the facts and research presented here.

Notes

[1] James Kittfield, "The Space and Air Force" *Air Force Association Magazine* 81,no. 2 (February, 1998): 36.

[2] Carl H. Builder, *The Icarus Syndrome* (New Brunswick, U.S.A.: Transaction Publishers, 1996), 63.

[3] William Mitchell, *Winged Defense* (New York, Dover Publications, 1988), xvi.

Afterword

Whether you agree or disagree with the conclusion of this research, the reader must concur that the topic does open comparative avenues of discussion. Some suggestions for further research follow:

-Surveying the Air Force population on their opinions of space and air roles and functions. An ensuing discourse could improve both the Air Force and Space Force design of theory and doctrine, as well as the application of airpower and space power.

-Exploring the Department of Defense in the year 2050. An examination of the structure of the services based on technology improvements would be profitable.

Finally, the issues of airpower, space power and aerospace should be presented as topics of discussion at the next Air Force General Officer CORONA conference. Senior leadership perspectives on these issues would be profitable for the Air Force as an organization.

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